

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1-5. (Canceled)

6. (New): A driving control device for an actuator comprising:

a drive circuit configured to drive an electric motor of an actuator for opening and closing an air conditioning door; and

a drive control circuit configured to control a rotation of said electric motor by controlling the drive circuit,

wherein said drive circuit includes an H bridge circuit having a switching semiconductor element,

wherein said drive circuit is configured to rotate said electric motor in forward and reverse directions by turning on and/or off said switching semiconductor element,

wherein said drive control circuit is configured to start and/or stop said electric motor by applying a PWM signal to the switching semiconductor element constructing a lower arm of said H bridge circuit.

7. (New): The actuator driving control device according to Claim 6, wherein a regenerative braking is applied to said electric motor by applying said PWM signal to the switching semiconductor element constructing said lower arm.

8. (New): The actuator driving control device according to Claim 6, wherein said drive control circuit is capable of selecting a first mode for applying the PWM signal, or a second mode for applying a driving pulse, to the switching semiconductor element constructing said lower arm.

9. (New): The actuator driving control device according to Claim 8, wherein said drive control circuit is configured to apply the driving pulse when a radio is turned on and is configured to apply the PWM signal when said radio is turned off.

10. (New): The actuator driving control device according to Claim 8, wherein said drive control circuit is configured to switch to the mode for applying the driving pulse when a targeted torque of the motor is not obtained even if the PWM signal is applied.

11. (New): The actuator driving control device according to Claim 6, wherein, when starting the electric motor, said drive control circuit is configured to apply the PWM signal to the switching semiconductor element constructing the lower arm of said H bridge circuit such that a duty ratio of the PWM signal increases based on a first predetermined rate.

12. (New): The actuator driving control device according to Claim 11, wherein, when stopping the electric motor, said drive control circuit is configured to apply the PWM signal to the switching semiconductor element constructing the lower arm of said H bridge circuit such that duty ratio of the PWM signal decreases based on a second predetermined rate.

13. (New): The actuator driving control device according to Claim 12, wherein the first and second predetermined rates are substantially equal.

14. (New): A driving control device for an actuator comprising:

a drive circuit configured to drive an electric motor of an actuator; and

a drive control circuit configured to control a rotation of said electric motor by controlling the drive circuit,

wherein said drive circuit includes an H bridge circuit having a switching semiconductor element,

wherein said drive circuit is configured to rotate said electric motor in forward and reverse directions by turning on and/or off said switching semiconductor element,

wherein said drive control circuit is configured to start and/or stop said electric motor by applying a PWM signal to the switching semiconductor element constructing a lower arm of said H bridge circuit, and

wherein said drive control circuit is configured to apply a driving pulse when a radio is turned on and is configured to apply the PWM signal when said radio is turned off.

15. (New): The actuator driving control device according to Claim 14, wherein a regenerative braking is applied to said electric motor by applying said PWM signal to the switching semiconductor element constructing said lower arm.

16. (New): The actuator driving control device according to Claim 14, wherein said drive control circuit is capable of selecting a first mode for applying the PWM signal, or a second mode for applying the driving pulse, to the switching semiconductor element constructing said lower arm.

17. (New): The actuator driving control device according to Claim 14, wherein said drive control circuit is configured to switch to the mode for applying the driving pulse when a targeted torque of the motor is not obtained even if the PWM signal is applied.

18. (New): The actuator driving control device according to Claim 14, wherein, when starting the electric motor, said drive control circuit is configured to apply the PWM signal to the switching semiconductor element constructing the lower arm of said H bridge circuit such that a duty ratio of the PWM signal increases based on a first predetermined rate.

19. (New): The actuator driving control device according to Claim 18, wherein, when stopping the electric motor, said drive control circuit is configured to apply the PWM signal to the switching semiconductor element constructing the lower arm of said H bridge circuit such that duty ratio of the PWM signal decreases based on a second predetermined rate.

20. (New): The actuator driving control device according to Claim 19, wherein the first and second predetermined rates are substantially equal.

21. (New): The actuator driving control device according to Claim 14, wherein the drive circuit is configured to drive the electric motor of the actuator for opening and closing an air conditioning door.

22. (New): A driving control device for an actuator comprising:
a drive circuit configured to drive an electric motor of an actuator; and
a drive control circuit configured to control a rotation of said electric motor by
controlling the drive circuit,
wherein said drive circuit includes an H bridge circuit having a switching
semiconductor element,
wherein said drive circuit is configured to rotate said electric motor in forward and
reverse directions by turning on and/or off said switching semiconductor element,
wherein said drive control circuit is configured to start and/or stop said electric motor
by applying a PWM signal to the switching semiconductor element constructing a lower arm
of said H bridge circuit, and
wherein a duty ratio of the PWM signal varies based on a predetermined rate from a
first value to a second value.

23. (New): The actuator driving control device according to Claim 22, wherein the
drive circuit configured to drive the electric motor of the actuator for opening and closing an
air conditioning door.

24. (New): The actuator driving control device according to Claim 22, wherein a
regenerative braking is applied to said electric motor by applying said PWM signal to the
switching semiconductor element constructing said lower arm.

25. (New): The actuator driving control device according to Claim 22, wherein said
drive control circuit is capable of selecting a first mode for applying the PWM signal, or a
second mode for applying a driving pulse, to the switching semiconductor element
constructing said lower arm.

26. (New): The actuator driving control device according to Claim 25, wherein said
drive control circuit is configured to apply the driving pulse when a radio is turned on and is
configured to apply the PWM signal when said radio is turned off.

27. (New): The actuator driving control device according to Claim 25, wherein said
drive control circuit is configured to switch to the mode for applying the driving pulse when a
targeted torque of the motor is not obtained even if the PWM signal is applied.

28. (New): The actuator driving control device according to Claim 22, wherein, when starting the electric motor, said drive control circuit is configured to apply the PWM signal to the switching semiconductor element constructing the lower arm of said H bridge circuit such that the duty ratio of the PWM signal increases based on the predetermined rate.

29. (New): The actuator driving control device according to Claim 28, wherein, when stopping the electric motor, said drive control circuit is configured to apply the PWM signal to the switching semiconductor element constructing the lower arm of said H bridge circuit such that duty ratio of the PWM signal decreases based on the predetermined rate.